C L A I M S:

1. A process for the preparation of cardiodilatin fragments of formula I

$$R^1\text{-ANP}(105\text{-}121)\text{-}R^2 \qquad (I),$$

having a chain length of 17 - 37 amino acids in total, wherein ANP(105-121) represents the amino acid sequence [SEQ ID NO. 1],

R^1 represents an amino acid chain of sequence ANP(90-104) [SEQ ID NO. 2] or fragments thereof having a chain length of 0 - 15 amino acids, and

R^2 represents an amino acid chain of sequence ANP(122-126) [SEQ ID NO. 3] or fragments thereof having a chain length of 0 - 5 amino acids, characterized in that synthesis is effected via condensation of at least three partial fragments, the condensation of said partial fragments to give the cardiodilatin fragment of formula I being carried out between the amino acid positions Gly^{108} and Arg^{109} and the amino acid positions Gly^{120} and Cys^{121}.

2. The process according to claim 1, wherein

(a) in a first step, condensation of the partial fragments is effected between the amino acid positions Gly^{120} and Cys^{121} from the partial fragments ANP(109-120) and Cys^{121}-R^2, and

(b) in a second step, condensation of the partial fragments is effected between the amino acid positions Gly^{108} and Arg^{109} from the partial fragment ANP(109-121)-R^2 obtained according to step (a) and the partial fragment R^1-ANP(105-108).

3. The process according to one of claims 1 or 2, wherein R^2 represents the amino acid sequence ANP(122-126), characterized in that in a first step, the fragment ANP(109-126)-OtBu is prepared by condensation of the fragment Fmoc-ANP(109-120)-OH, which is synthesized on a solid support phase according to the Merrifield process and removed therefrom, with the fragment H-ANP(121-126)-OtBu, and subsequently, the Fmoc protecting group is removed from the resulting fragment Fmoc-ANP(109-126)-OtBu.

4. The process according to one of claims 1-3, wherein R^1 represents the amino acid sequence ANP(95-104), characterized in that the cardiodilatin fragment of formula I is prepared by condensation of the fragment Boc-ANP(95-108)-OH, which is synthesized on a solid support phase according to the Merrifield process and removed therefrom, with the fragment H-ANP(109-126)-OtBu, and subsequently, the protecting groups are removed from the resulting fragment Boc-ANP(95-126)-OtBu.

5. The process according to one of claims 1-4, characterized in that when forming the three partial fragments R^1-ANP(105-108), ANP(109-120) or ANP(121)-R^2 according to the Merrifield process, bonding to the solid support material is effected by means of a super-acid-sensitive linker.

6. The process according to one of claims 1-5, characterized in that the amino and hydroxy protecting groups are removed from the obtained fully protected cardiodilatin fragment R^1-ANP(105-121)-R^2, forming the fragment protected by the protecting group Acm at Cys^{105}, and subsequently, the protecting group Acm is

removed from the thus obtained fragment and thereafter, the cardiodilatin fragment is cyclized by oxidation.

7. The process according to one of claims 1-6, characterized in that R^1 represents the amino acid sequence selected from the group of ANP(95-104), ANP(99-104) and ANP(102-104).

8. The process according to one of claims 1-7, characterized in that R^2 represents the amino acid sequence selected from the group of ANP(122-125) and ANP(122-126).

9. A process for the preparation of high-purity cardiodilatin fragments R^1-ANP(105-121)-R^2 having a chain length of 17-37 amino acids in total, wherein R^1 represents an amino acid chain of sequence ANP(90-104) or fragments thereof having a chain length of 0-15 amino acids, and R^2 represents an amino acid chain of sequence ANP(122-126) or fragments thereof having a chain length of 0-5 amino acids, characterized in that purification of the crude product is performed using a reversed-phase HPLC column, and the cardiodilatin fragment is eluted with a buffer system containing triethylammonium phosphate and acetonitrile.

10. The process according to claim 9, characterized in that the elution is performed at a pH value of 2-5, more specifically of 2-3.

11. The process according to one of claims 9 or 10, characterized in that the reversed-phase HPLC column is equilibrated with a triethylammonium phosphate buffer, thereafter the concentrated crude product of the cardiodilatin fragment is applied and subsequently, the cardiodilatin fragment is eluted by continuous charging of a buffer mixture of triethylammonium phosphate in

water and acetonitrile (2:3 v/v) in a continuous gradient.

12. High-purity cardiodilatin fragments R^1-ANP(105-121)-R^2 having a chain length of 17-37 amino acids in total, wherein R^1 represents an amino acid chain of sequence ANP(90-104) or fragments thereof having a chain length of 0-15 amino acids, and R^2 represents an amino acid chain of sequence ANP(122-126) or fragments thereof having a chain length of 0-5 amino acids, characterized in that they are substantially free of peptide impurities and exhibit a single migration peak in the purity analysis using capillary electrophoresis.

13. The high-purity cardiodilatin fragments of claim 12, characterized in that R^1 represents an amino acid sequence selected from the group of ANP(95-104), ANP(99-104) and ANP(102-104).

14. The high-purity cardiodilatin fragments of claim 12 or 13, characterized in that R^2 represents an amino acid sequence selected from the group of ANP(122-125) and ANP(122-126).

15. The high-purity cardiodilatin fragments according to one of claims 12-14, selected from the group of ANP(95-126), ANP(99-126), ANP(102-126), and ANP(103-126).

16. Pharmaceutical formulations, containing the high-purity cardiodilatin fragment according to one of claims 12-15 in addition to physiologically acceptable adjuvants or additives.

17. Peptide fragments having the amino acid sequence R^1-ANP(105-108), wherein R^1 represents an amino acid chain of sequence ANP(90-104) or fragments thereof

having a chain length of 0-15 amino acids, as well as their derivatives modified by protecting groups.

18. Peptide fragment having the amino acid sequence ANP(109-120), as well as derivatives thereof modified by protecting groups.

19. Peptide fragments having the amino acid sequence ANP(109-121)-R^2, wherein R^2 represents an amino acid chain of sequence ANP(122-126) or fragments thereof having a chain length of 0-5 amino acids, as well as their derivatives modified by protecting groups.

20. Peptide fragments having the amino acid sequence Cys^{121}-R^2, wherein R^2 represents an amino acid chain of sequence ANP(122-126) or fragments thereof having a chain length of 3-5 amino acids, as well as their derivatives modified by protecting groups.

08523802.072202